

# Description of a New Species of *Inola* Davies (Araneae: Pisauridae), the Male of *I. subtilis* Davies and Notes on Their Chromosomes

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Manuscript received 5 March 2010, accepted for publication 21 April 2010.

KEYWORDS: chromosomes, *Inola*, Pisaurid, Queensland, rainforest, spider.

## INTRODUCTION

Australian pisaurid spiders are generally not web builders, except for members of *Inola* Davies, 1982 and *Dendolycosa* Koch, 1876. The genus *Inola* includes three species from northeastern Queensland (Davies, 1982). Like Davies' *Inola* species, *Inola daviesae* sp.n. described here is a delicate, medium-sized spider associated with tropical rainforest. As with other members of the genus, this spider runs on the upper surface of its horizontal sheet web. These webs project from the trunks of rainforest trees or embankments. A short silken funnel extends from the sheet web to a retreat in a tree trunk or embankment. The females, like those of other pisaurids, grasp their egg sacs in their chelicerae when disturbed and carry them into their retreat (Davies, 1982).

Abbreviations: CL cephalothorax length; CW cephalothorax width; AL abdomen length; AW abdomen width; MOQ median ocular quadrangle; AM Australian Museum; QM Queensland Museum.

## MATERIALS AND METHODS

### Morphology

Measurements were made with an ocular micrometer and converted to millimetres. Measurements are for a single specimen with a range of variation if significant. Spines have been recorded as number per surface for each segment, as they were often staggered.

### Chromosomes

Live penultimate male spiders were anaesthetized with CO<sub>2</sub>. The testes were dissected out and sections were spread, fixed and stained after the method of Rowell (1991). These preparations were viewed and photographed using a light microscope. Counts and other observations were noted from photographs of many (>50), suitable meiotic cells in metaphase and chromosome numbers for species determined by the mode.

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SYSTEMATICS

Genus *Inola* Davies, 1982

*Inola* Davies, 1982: 479  
Type species: *Inola amicabile* Davies, 1982, by original designation (page 480).

*Inola daviesae* n.sp.  
Figs (1-4, 7-11)

Types

Holotype: male, Leo Creek, MacIlwraith Ranges, North Qld. [13°32'S 143°29'E], July, 1995, M. Humphrey, M. Moulds, KS58316 (AM). Paratypes: 1 female, same data as holotype, KS58322 (AM); 1 male, 5 females, Qld. MacIlwraith Ranges, Leo Creek [13°32'S 143°29'E], 20 Jul 1995, M. Humphrey, M. Moulds, F. MacKillop, KS43933 (AM); 1 male, 1 female, data as for holotype, QMS 83903 (QM).

Other material examined

Eleven juveniles, same data as holotype, KS58315 (AM).

Distribution

Rainforest, MacIlwraith Range, north-eastern Queensland at an altitude of approximately 500m.

Diagnosis

Males can be distinguished from other members of the genus by the distinctive spannerhead-shaped distal portion of the median apophysis of the male palp (Fig. 8). The female scape is narrow while that of *I. cracentis* is broad and that of *I. subtilis* is triangular, pointed posteriorly and broad anteriorly.

Description of male

Measurements of holotype: CL 4.3, CW 2.7, AL 5.9, AW 1.7. Eye group: anterior width 1.1; posterior width 1.1; length 0.6; MOQ: anterior width 0.4; posterior width 0.5; length 0.5. Maxilla: length 1.3; width 0.8; Sternum: length 1.9; width 1.9; Colulus: length 0.2; width 0.3. Leg lengths:

|            | Palp | 1    | 2    | 3    | 4    |
|------------|------|------|------|------|------|
| Femur      | 4.5  | 11.9 | 11.4 | 7.6  | 11.3 |
| Patella    | 1.6  | 1.9  | 2.0  | 1.4  | 1.5  |
| Tibia      | 1.9  | 11.1 | 11.3 | 8.9  | 10.3 |
| Metatarsus | —    | 15.1 | 14.6 | 9.8  | 15.4 |
| Tarsus     | 4.6  | 4.9  | 4.6  | 3.5  | 4.9  |
| Total      | 12.6 | 44.9 | 43.9 | 31.2 | 43.4 |

Spine notation: Palp: femur, d3p1; patella, d5p1r1; tibia, d2r2; tarsus, 0. Leg I: femur, d4p5; patella, d1; tibia, d3p3r2v3; metatarsus, p4r4v1, whorl of four small spines distally; tarsus, 0. Leg II: femur, d2p5r5; patella, d1; tibia, d2p3r4v3; metatarsus, p3r4, whorl of four small spines distally; tarsus, 0. Leg III: femur, d2p4r5; patella, d1; tibia, p2r4v3; metatarsus, p4r4, whorl of four small spines distally; tarsus, 0. Leg IV: femur, d3p4r2; patella, d1; tibia p3r3v2; metatarsus, d4p4; tarsus, 0. Note: four distal spines on end of each metatarsus.

Eye diameters roughly equal. Cephalothorax patterned (Fig.1). Abdomen with central pale stripe to almost half the length of abdomen. Pair of pale latero-dorsal stripes, running three quarters of the abdomen. Two or three pairs of prominent pale spots between the central and the latero-dorsal stripes. Legs banded.

Palp (Figs. 7, 8). Digitiform portion half the length of the palpal tarsus. Median apophysis large and partly membranous, partly sclerotised. Distal sclerotised portion bifid (spanner-like). Embolus slender and curved. Conductor behind median apophysis with a fold distally.

Description of female

Measurements of KS58322: CL 3.9, CW 3.4, AL 6.9, AW 4.7. Eye group: anterior width 1.5; posterior width 1.6; length 1.0; MOQ: anterior width 0.7; posterior width 0.8; length 0.7. Maxilla: length 1.6; width 1.0. Sternum: length 2.6; width 2.1; Colulus: length 0.2; width 0.3. Leg lengths:

|            | Palp | 1    | 2    | 3    | 4    |
|------------|------|------|------|------|------|
| Femur      | 2.8  | 8.6  | 9.4  | 7.5  | 9.4  |
| Patella    | 1.0  | 2.2  | 1.9  | 1.6  | 1.6  |
| Tibia      | 1.4  | 8.8  | 9.3  | 6.1  | 8.0  |
| Metatarsus | —    | 10.4 | 8.6  | 7.9  | 12.5 |
| Tarsus     | 3.1  | 3.0  | 3.5  | 3.1  | 4.3  |
| Total      | 8.3  | 33.0 | 32.7 | 26.2 | 35.8 |

Spine notation: Palp: femur, d1p1; patella, d1p1; tibia d2p2r1, tarsus, p2. Leg I: femur, d2r2; patella, d1; tibia, d1r2v1; metatarsus, d3r4v2, whorl of four small spines distally, tarsus, 0. Leg II: femur, d2p5r5; patella, d1; tibia, d1p2r2v1; metatarsus, d3p2r4v2, whorl of four small spines distally; tarsus, 0. Leg III: femur, d4p2v1; patella, d1r1; tibia, 0; metatarsus, d1p2r2v2, whorl of four small spines distally; tarsus, 0. Leg IV: femur, d4r5; patella d1r1; tibia, 0; Metatarsus, d2p3r1v2, whorl of four small spines distally; tarsus, 0. Note: four distal spines on end of metatarsus (every leg).

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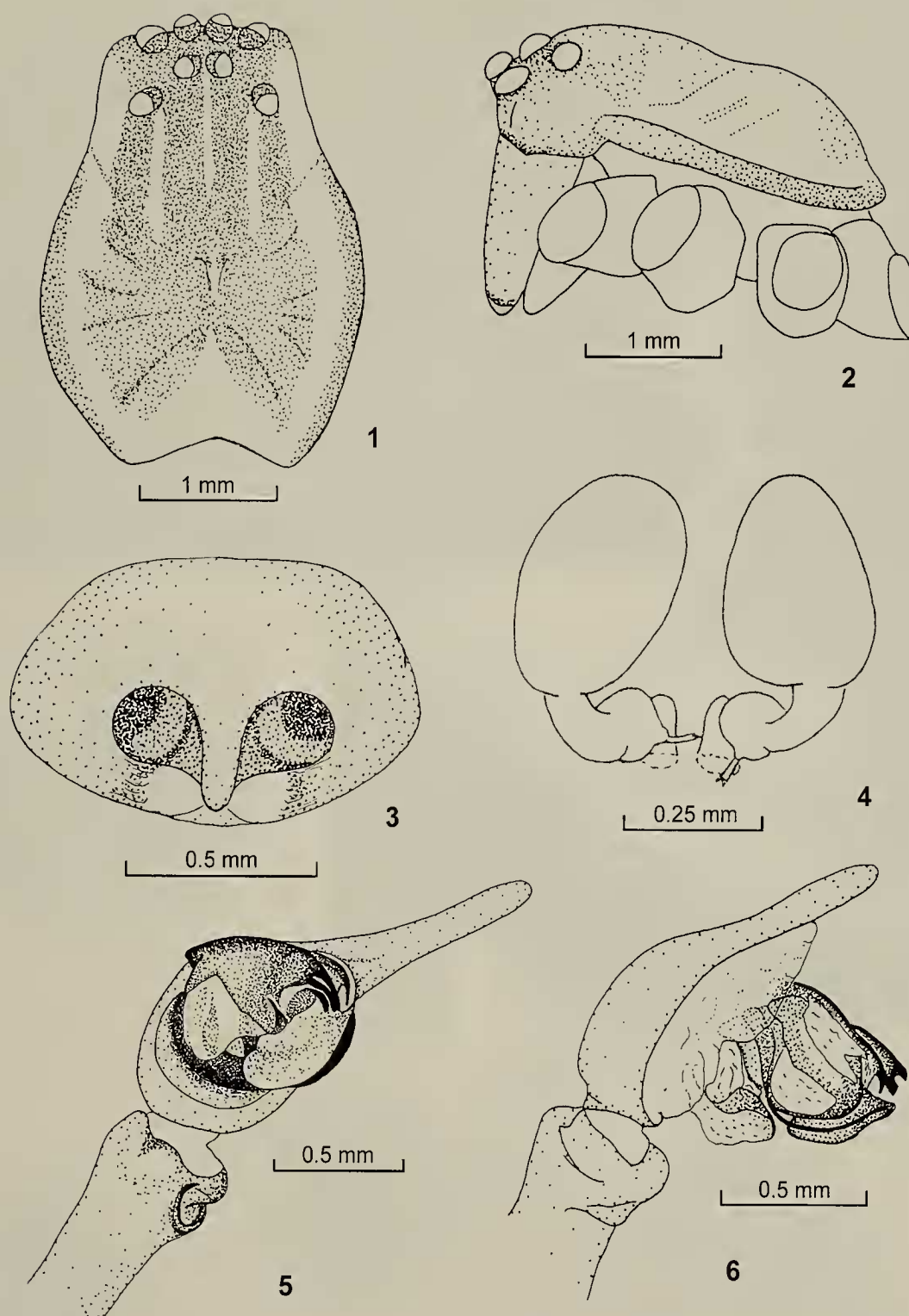
Palp (Figs.7, 8). Digitiform portion half the length of the palpal tarsus. Median apophysis large and partly membranous, partly sclerotised. Distal sclerotised portion bifid (spanner-like). Embolus slender and curved. Conductor behind median apophysis with a fold distally.

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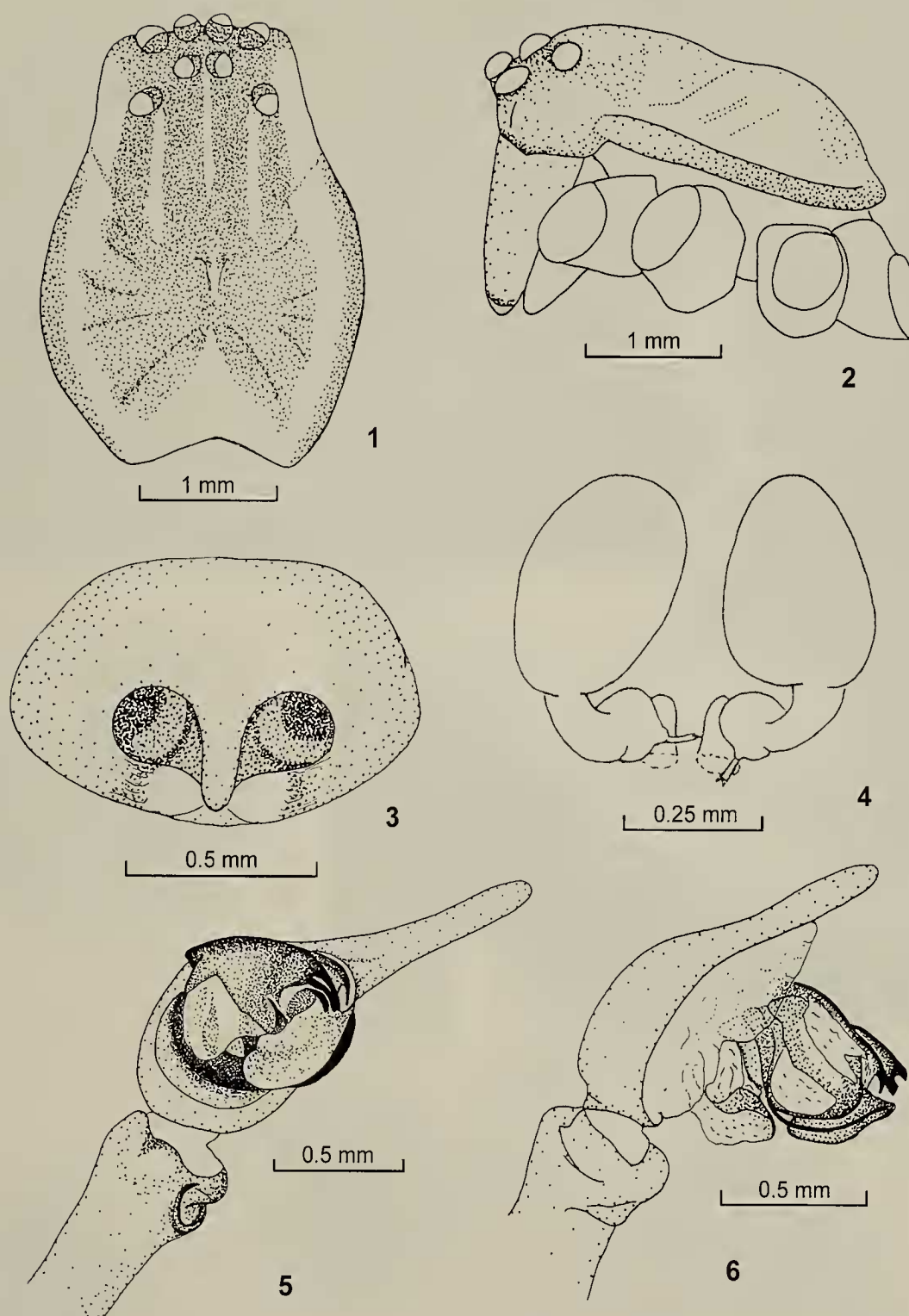
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|            | Palp | 1    | 2    | 3    | 4    |
|------------|------|------|------|------|------|
| Femur      | 2.8  | 8.6  | 9.4  | 7.5  | 9.4  |
| Patella    | 1.0  | 2.2  | 1.9  | 1.6  | 1.6  |
| Tibia      | 1.4  | 8.8  | 9.3  | 6.1  | 8.0  |
| Metatarsus | —    | 10.4 | 8.6  | 7.9  | 12.5 |
| Tarsus     | 3.1  | 3.0  | 3.5  | 3.1  | 4.3  |
| Total      | 8.3  | 33.0 | 32.7 | 26.2 | 35.8 |

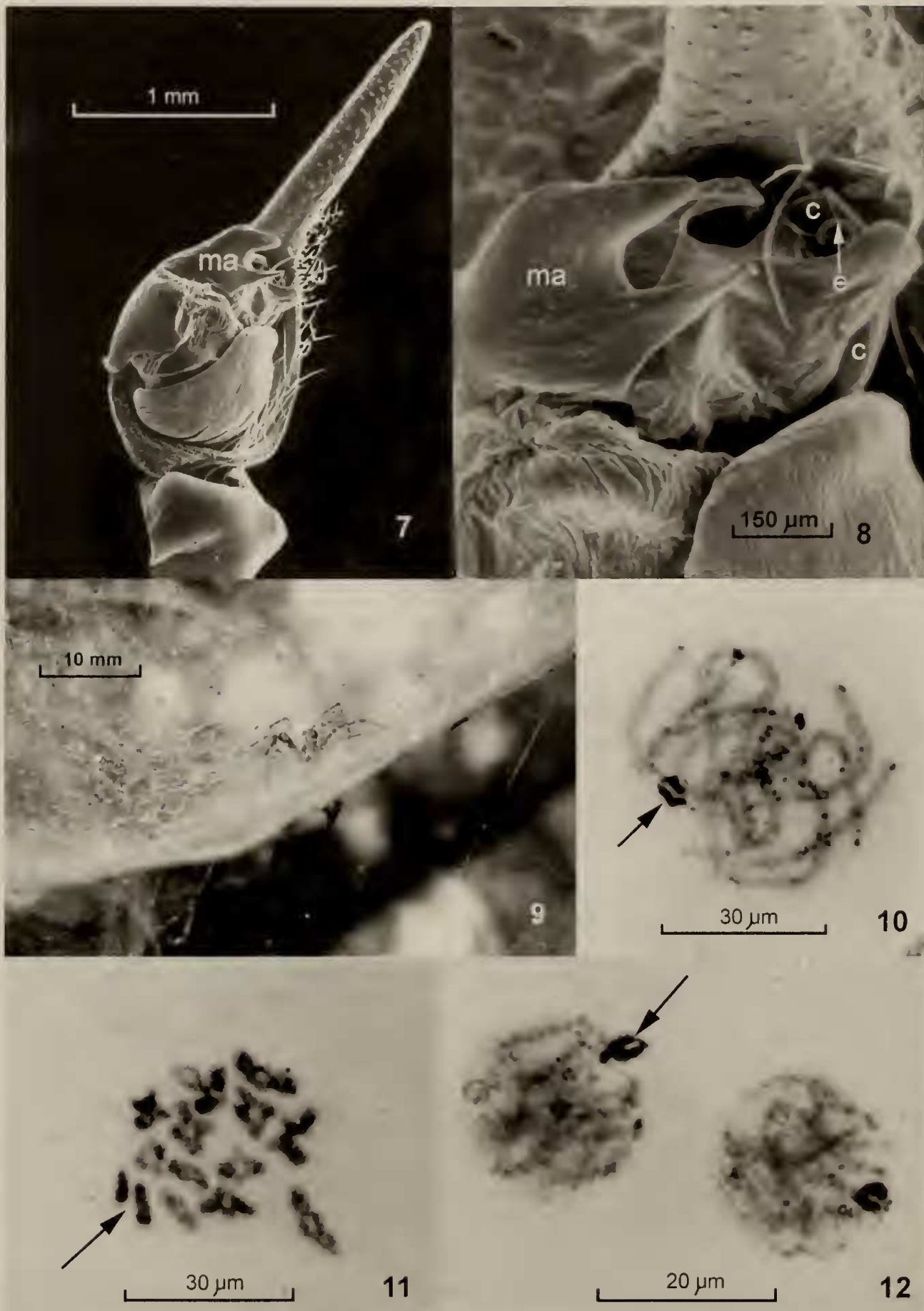
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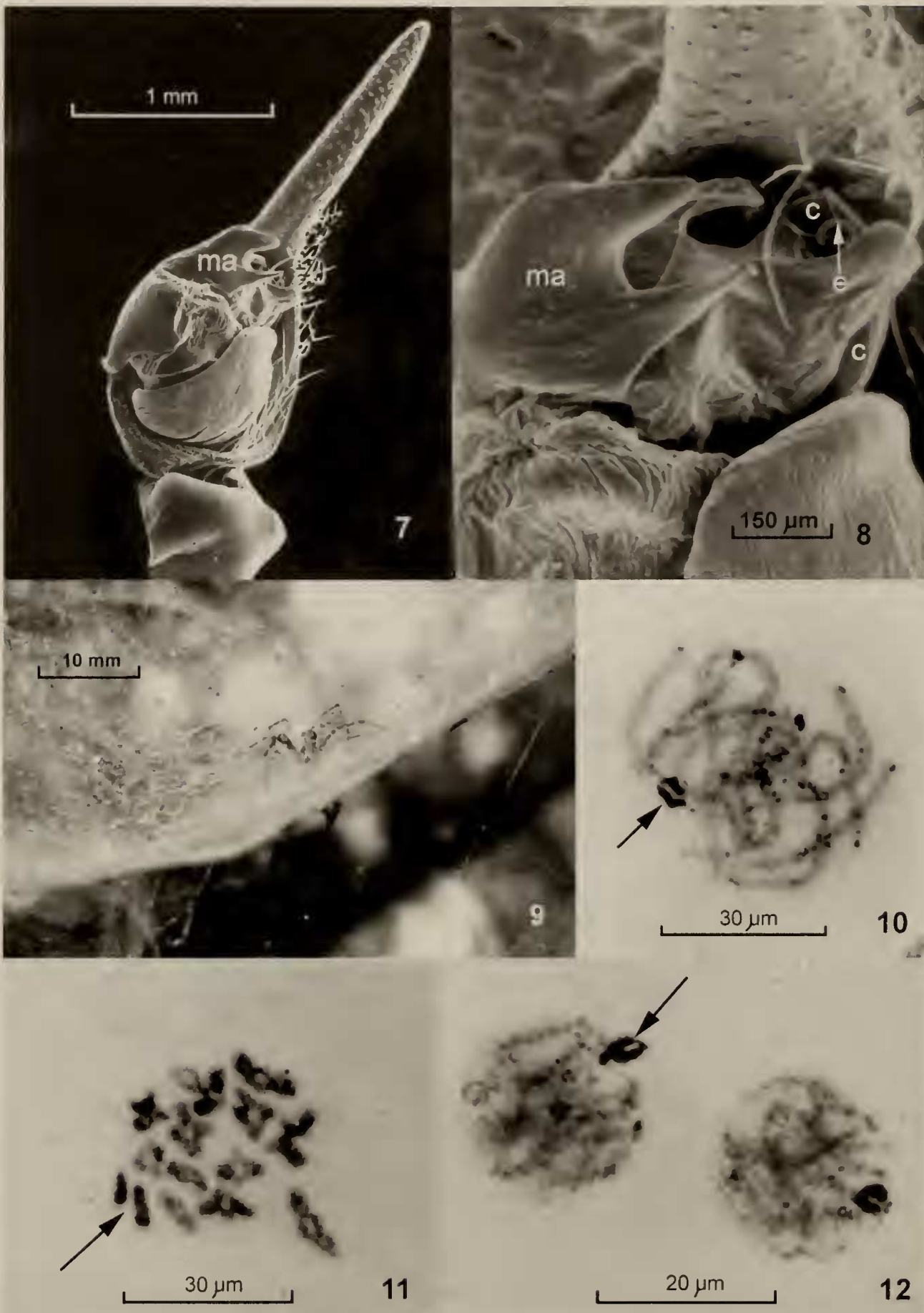
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Figures 7-12. 7, male palp of *Inola daviesae* sp.n. 8, median apophysis (ma), embolus (e) and conductor (c) of *Inola daviesae* sp. n. 9, *Inola daviesae* sp.n. female on sheet web. 10, *Inola daviesae* sp.n., prophase male meiotic chromosomes showing two dense sex chromosomes (arrowed). 11, *Inola daviesae* sp.n., male meiotic cell showing 14 pairs of chromosomes. 12, *Inola subtilis*, male prophase meiosis showing two densely stained sex chromosomes (arrowed).



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Epigynum (Figs 3, 4). Scape a narrow bar. Insemination ducts arise near hind edge of the epigastrium and travel forward. Large stalked spermathacae. Insemination duct enters near the base of the posterior spermathacae (fertilisation duct leaves below this junction).

Chromosomes

For males of *I. daviesae* sp. n., 2N = 28 (Fig. 11), including two subequal, darkly staining sex chromosomes. Most of the 13 pairs of autosomes in *Inola daviesae* sp. n. appear to be telocentric. The two sex chromosomes are easily distinguished in prophase of meiosis (Fig. 10). They migrate from the equator of the spindle in metaphase as a pair and earlier than the autosomes. Such sex chromosomes and their behaviour have been observed in other spiders by Rowell (1991). According to a survey of spider chromosome studies, (Rowell, personal comm.), female spiders have double the number of sex chromosomes to those of the male. Presuming this species follows the same sex determination mechanism, males of *Inola daviesae* n. sp. would be XX and females XXXX, giving females 2N = 32.

Etymology.

Named for Valerie Todd Davies who described the genus.

*Inola subtilis* Davies, 1982  
(Figs 5, 6)

Material examined

1 male, Goldsborough S. F., Qld., July, 1995, M. Humphrey, KS58321 (AM); 1 male, data as for KS58321, QMS83902 (QM); 3 males, data as for KS58321, KS58320 (AM); 1 male, Palm Cove, FNQ, J.Olive, 6 Sept 1995, sheet web on fallen log, KS044108 (AM); Goldsborough Valley SF, rainforest strangler fig, 27 Jul 1995, M. Humphrey, KS043900 (AM).

Distribution

Material from Davies' description of the species indicates a distribution on the western edge of suburban Cairns. The material examined above extends this distribution from Palm Cove (north of Cairns) to the Goldsborough Valley in the south.

Diagnosis for male

Unlike the other three members of the genus, the sclerotised distal portion of the male palpal median apophysis forms two, fused, parallel, curved processes

(Fig. 5). Proximally is a long, narrow sclerotised spur pointing ventrally, at right angles to the palp. Conductor sclerotised, retrolateral, behind the large median apophysis and bearing a spine distally.

Description of male

Measurements of KS58321: CL 3.5, CW 2.8, AL 4.4, AW 1.44; Eye group: anterior width 0.8; posterior width 1.2; length 0.8; MOQ: anterior width 0.5, posterior width 0.6, length 0.5. Maxilla: length 1.0; width 0.5. Sternum: length 1.8, width 1.7. Colulus: length 0.3, width 0.5. Leg lengths:

|            | Palp | 1    | 2    | 3    | 4    |
|------------|------|------|------|------|------|
| Femur      | 2.0  | 10.0 | 9.3  | 7.5  | 9.4  |
| Patella    | 0.6  | 1.6  | 1.6  | 1.5  | 1.5  |
| Tibia      | 0.8  | 10.3 | 9.4  | 6.9  | 8.9  |
| Metatarsus |      |      |      |      |      |
|            | —    | 12.6 | 12.1 | 9.1  | 13.0 |
| Tarsus     | 1.6  | 3.9  | 3.6  | 2.5  | 3.3  |
| Total      | 5.0  | 38.4 | 36.0 | 27.5 | 36.1 |

Spine notations: Palp: femur, d2p1; patella, d1p1r1; tibia, d2p2; tarsus, 0. Leg I: femur, d2p8r3; patella, d1; tibia, d3p2r2v4; metatarsus, d3p2r5v2; tarsus, 0. Leg II: femur, p5; patella, d5p6r3; tibia, d2p2r2v3; metatarsus, d1p3r3v1; tarsus, 0. Leg III: femur, d2p5r5; patella, d1; tibia, d2p3r3v3; metatarsus, d2p2r2v2; tarsus, 0. Leg IV: femur, d2p5r2; patella, d2p4r2v3; tibia, d1p1r3v1; metatarsus, d2p2r2; tarsus, 0.

Abdomen long and narrow. Abdominal pattern with pale centre stripe and a pair of pale latero-dorsal stripes. Pairs of prominent pale spots as in *I. daviesae* but spots continue in line and merge to form a pair of additional stripes. Legs banded.

Male palp (see diagnosis): Length of digitiform portion almost half of palpal tarsus. Embolus curved, slender, lying between median apophysis and conductor.

Chromosomes

Because of poor spreading, the number of chromosomes of *I. subtilis* could only be estimated. However, it is between 26 and 32 and most of the chromosomes are telocentric. There are two sex chromosomes (Fig. 12) and like those of *I. daviesae* sp. n., they are darkly staining and migrate from the equator of the spindle earlier than the autosomes.

Epigynum (Figs 3, 4). Scape a narrow bar. Insemination ducts arise near hind edge of the epigastrium and travel forward. Large stalked spermathacae. Insemination duct enters near the base of the posterior spermathacae (fertilisation duct leaves below this junction).

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| Patella    | 0.6  | 1.6  | 1.6  | 1.5  | 1.5  |
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| Metatarsus |      |      |      |      |      |
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| Tarsus     | 1.6  | 3.9  | 3.6  | 2.5  | 3.3  |
| Total      | 5.0  | 38.4 | 36.0 | 27.5 | 36.1 |

Spine notations: Palp: femur, d2p1; patella, d1p1r1; tibia, d2p2; tarsus, 0. Leg I: femur, d2p8r3; patella, d1; tibia, d3p2r2v4; metatarsus, d3p2r5v2; tarsus, 0. Leg II: femur, p5; patella, d5p6r3; tibia, d2p2r2v3; metatarsus, d1p3r3v1; tarsus, 0. Leg III: femur, d2p5r5; patella, d1; tibia, d2p3r3v3; metatarsus, d2p2r2v2; tarsus, 0. Leg IV: femur, d2p5r2; patella, d2p4r2v3; tibia, d1p1r3v1; metatarsus, d2p2r2; tarsus, 0.

Abdomen long and narrow. Abdominal pattern with pale centre stripe and a pair of pale latero-dorsal stripes. Pairs of prominent pale spots as in *I. daviesae* but spots continue in line and merge to form a pair of additional stripes. Legs banded.

Male palp (see diagnosis): Length of digitiform portion almost half of palpal tarsus. Embolus curved, slender, lying between median apophysis and conductor.

Chromosomes

Because of poor spreading, the number of chromosomes of *I. subtilis* could only be estimated. However, it is between 26 and 32 and most of the chromosomes are telocentric. There are two sex chromosomes (Fig. 12) and like those of *I. daviesae* sp. n., they are darkly staining and migrate from the equator of the spindle earlier than the autosomes.

## NEW SPECIES OF *INOLA*

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- Davies, V. T. (1982). *Inola* nov. gen., a web-building pisaurid (Araneae: Pisauridae) from northern Australia with descriptions of three species. *Memoirs of the Queensland Museum* **20**(3): 479-487.
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